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Helicobacter pylori associated gastritis: A histopathological study of gastric mucosal biopsies

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Abstract

Background: Helicobacter pylori (H. pylori) is one of the major cause of gastrointestinal diseases. It is classified as class-I carcinogen & thus Its important to study the histological changes in H. pylori gastritis.

Aim: To evaluate associated histological features and prevalence of H. pylori associated gastritis by histopathological method.

Methods and Material: Biopsies from 75 patients with various upper gastrointestinal symptoms were studied. Study period was from August 2016 to August 2018. Each biopsy was stained with Haematoxylin & Eosin (H&E) & Warthin Starry silver stain. The slides were examined for H. pylori & various histological features.

Results: H. pylori infection was high in the fourth decade with male predominance. 47/75 (62.6%) cases were H. pylori positive. Among H. pylori positive cases neutrophilia activity, mononuclear infiltrate, atrophy & intestinal metaplasia was seen in 93.6%, 100%, 14.9% & 2.2% cases respectively.

Conclusion: Histopathological evaluation is the gold standard for diagnosing H. pylori infection. Furthermore, large scale studies are required to evaluate H. pylori associated gastritis to prevent morbidity & mortality.

Keywords: Helicobacter pylori, histopathological, gastric mucosal biopsies

Introduction

Upper gastrointestinal tract diseases are one of the commonest diseases encountered in medical and surgical practices worldwide. There are multiple definitive and suspected etiological entities and risk factors associated with gastroduodenal lesions amongst which Helicobacter pylori (H. pylori) infection is the commonest. The prevalence of H. pylori in United States is 35.6% and in India is 63.5% [1]. Exact mode of transmission of H. pylori infection is not known, but oral-oral, faecal-oral and direct contact modes are suspected to be the modes of transmission of H. pylori [2]. Helicobacter pylori was grouped as class-I carcinogen in Humans by World Health Organization (WHO) and The International Agency for research on Cancer in 1994 [3]. Therefore, today it is a major concern to diagnose H. pylori. In Haematoxylin and Eosin stain H. pylori is difficult to be identified with ease & requires special histochemical stains for its demonstration.

H. pylori plays an important role in causing gastric pathology and therefore this study was conducted to identify H. pylori and to note the histological features of gastritis associated with H. pylori, so as to prevent the mortality and morbidity associated with it.

Materials and Methods

This cross sectional study was conducted in the Department of Pathology in a 1200 bedded tertiary hospital, Chennai. This study was conducted with 75 samples. Upper endoscopic biopsies done for various upper gastrointestinal symptoms, received from August 2016 - August 2018 were included in the study. Biopsy materials were processed and sections of 5 micron thickness were cut. Sections of each case were stained with Hematoxylin & Eosin and Warthin Starry silver stain and were examined. The slides were examined by two pathologists. Microscopic features were studied on Hematoxylin & Eosin stained slides. Identification of H. pylori was done under oil immersion on Hematoxylin & Eosin and was confirmed by Warthin Starry silver stain.

Results

Presence and absence of *H. pylori* and morphological changes due to *H. pylori* gastritis were studied in 75 cases and the results were obtained.

H. pylori was positive in 47/75 (62.6%) cases and 28/75 (37.4%) cases were negative for *H. pylori* by histopathological method.

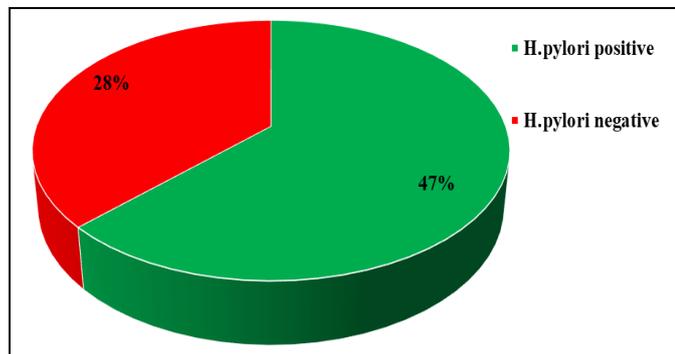


Fig 1: Helicobacter pylori infection in 75 cases



Fig 2: Gastric mucosa showing mild *H. pylori* density, H&E x1000

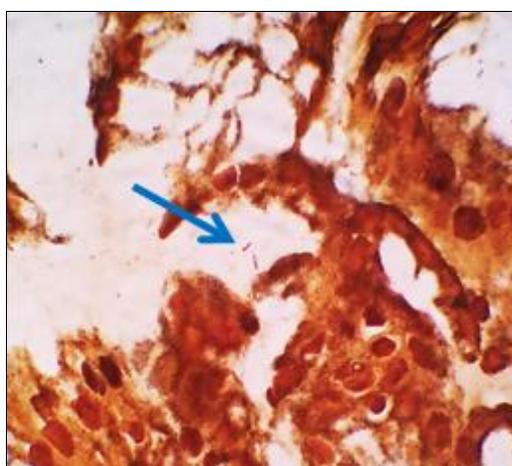


Fig 3: Gastric mucosa with mild *H. pylori* density, Warthin Starry x1000

The most common age of incidence in the present study was 41 to 50 years with male predominance. The male to female ratio was 2.27:1.

Microscopic features associated with *H. pylori* gastritis were

noted (Table 1). Out of 47 *H. pylori* positive cases 44 (93.6%) showed neutrophilic infiltration, 47 (100%) cases showed mononuclear infiltrate, 7 (14.9%) cases showed atrophy and 1 (2.2%) case showed intestinal metaplasia (Table 1).

Table 1: Association of various histological features with *H. pylori* positivity.

Histological feature	<i>H. pylori</i> positive cases with histological features
Neutrophilic infiltrate	44/47 (93.6%)
Mononuclear infiltrate	47/47 (100%)
Atrophy	07/47 (14.9%)
Intestinal metaplasia	01/47 (2.2%)

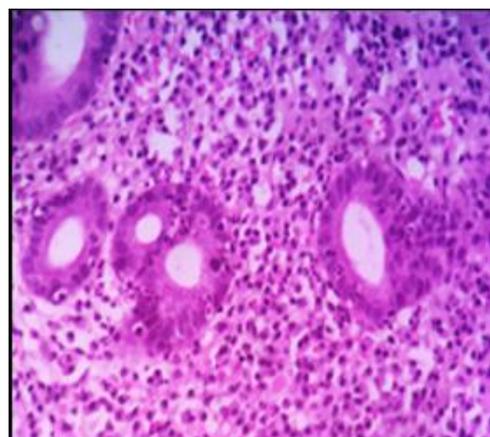


Fig 4: Neutrophilic infiltrate, H&E x400

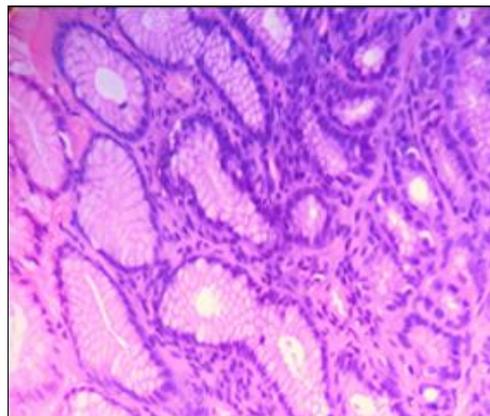


Fig 5: Mononuclear infiltrate, H&E x400

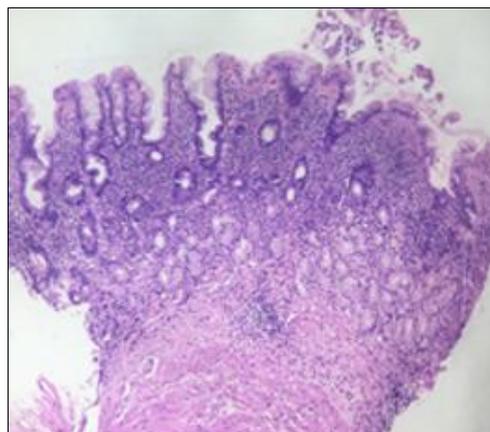


Fig 6: Atrophy of glands, H&E x100

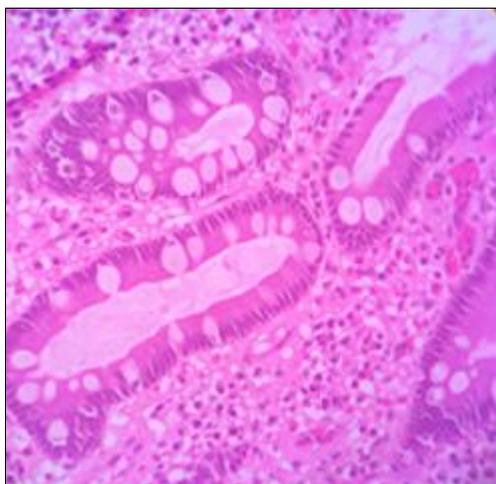


Fig 7: Intestinal metaplasia, H&E x400

Discussion

In the present study *H.pylori* was detected in 47 (62.6%) cases of gastritis. This was similar to the prevalence stated by Maitra TN *et al.* [4] 66.9% and Yakub MY *et al.* [5] 62.5%. Akanda MR *et al.* [6] 45.6% and Dandin AS *et al.* [7] 48.0% reported a lower prevalence in their study.

In the current study, peak prevalence of *H. pylori* infection was in the age group between 41 to 50 years (4th decade), this was similar to the study done by Bozorgnia MA *et al.* [8] and Correa GS *et al.* [9]. Studies done by Mujawar P *et al.* [10] and Priyadarshini M *et al.* [11] showed peak incidence in lower decades.

We noted male predominance in *H.pylori* positive cases in the present study and this was in concordance with studies done by Mujawar *et al.* [10] and Palaniappan VM *et al.* [12]. Studies done by Basir HRG *et al.* [13] and Priyadarshini M *et al.* [11] showed female predominance of *H. pylori* infection.

In this study 93.6% cases positive for *H. pylori* infection showed neutrophilic activity. Similar findings were noted in study done by Palaniappan VM *et al.* [12], while studies done by Pity IS *et al.* [14] and Maharjan S *et al.* [15] showed a lower number of *H.pylori* positive cases associated with activity.

In the present study all 47/47 (100%) cases positive for *H.pylori* showed mononuclear infiltrate. This was similar to the results showed in Tanko MN *et al.* [16]. On the contrary, Pity IS *et al.* [14] and Maharjan S *et al.* [15] showed decreased number of *H. pylori* positive cases with mononuclear infiltrate.

We noted very few *H.pylori* positive cases associated with atrophy (14.9%). Similar results were noted in studies done by Tanko MN *et al.* [16] and Maharjan S *et al.* [15]. This may be explained due to decrease of mucus secretion in atrophic glands that provides an unsuitable environment for *H.pylori* colonization [16].

Among 47 *H. pylori* positive cases only 1 (2.2%) case showed intestinal metaplasia. Pity IS *et al.* [14] and Maharjan S *et al.* [15] showed increased number of cases infected with *H. pylori* showing intestinal metaplasia. This may be due to absence of *H. pylori* in alkaline media caused by intestinal metaplasia [14].

Conclusion

We conclude that *H.pylori* infection is common in Chennai, India. Our study showed a high prevalence of 62.6% *H.pylori* associated gastritis in patients with upper

gastrointestinal symptoms undergoing endoscopic biopsy. Early and definitive diagnosis by detection of *H.pylori* on histopathology can help by initiating proper antibacterial therapy and therefore play a major role in patient recovery.

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